AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 (currently amended): A metrology instrument for measuring and inspecting deviations between a pair of pattern elements ~~of a pattern~~ to be stitched within an image formed by electron beam lithography, said metrology instrument comprising:

a means for obtaining an image of the stitched pattern for inspection, said image ~~pattern having a stitching part at which~~ displaying a pair of elements of said image pattern ~~are~~ having perpendicular edges extending in X and Y directions and being stitched to each other to align along a straight boundary line extending ~~along said stitching part~~ in the X direction;

a ΔX-measuring device for measuring the deviation ΔX between stitched elements of said image pattern along said straight boundary line;

a storing means for ~~storing two~~ storing in computer memory sets of data ~~about~~ defining dose distribution images of each pattern element in said pair of pattern elements indicating the dose distributions ~~in memory~~, said dose ~~distributions~~ distribution images being calculated by a simulation method under the condition that ~~an~~ a selected energetic beam is used when said pattern elements ~~of said pattern~~ are transferred;

an image superimposing means for shifting one of the dose distribution images ~~indicating the dose distributions~~ measured by said ΔX along said straight boundary line and by a desired amount ΔY in a direction ~~vertical~~ perpendicular to said straight boundary line relatively to the other and superimposing both of said dose distribution images ~~indicating the dose distributions~~; and

an image comparator for taking the correlation between image data obtained for said inspection and said superimposed dose distribution image data ~~produced by the superimposing~~ by comparing these two kinds of image data.

Claim 2 (original): The metrology instrument of claim 1, wherein there are further provided a decision device for making a decision based on said correlation as to whether said ΔY should be updated and a ΔY-setting device for resetting ΔY if said ΔY is

updated, and wherein said ΔY is updated until said correlation becomes less than a given value.

Claim 3 (original): The metrology instrument of claim 1, further comprising a ΔY-setting device for updating the value of ΔY a set number of times and a decision device for detecting the value of ΔY that minimizes said correlation.

Claim 4 (currently amended): The metrology instrument of any one of claims ~~1-3~~ 1 to 3, wherein image data about dose distributions of plural pattern shapes are stored in memory.

Claim 5 (currently amended): A metrology method for measuring and inspecting deviations between a pair of pattern elements ~~of a pattern~~ formed by electron beam lithography to be stitched within an image, said method comprising the steps of:

obtaining an image of the stitched pattern for inspection, said image ~~pattern having a stitching part at which~~ displaying a pair of elements of said image pattern ~~is~~ having perpendicular edges extending in X and Y directions and being stitched to each other to align along a straight boundary line extending ~~along said stitching part~~ in the X direction;

measuring the deviation ΔX between stitched elements of said image pattern along said straight boundary line;

storing ~~two~~ in computer memory sets of data about images of each pattern element in said pair of pattern elements indicating the dose distributions ~~in memory~~, said dose distributions being calculated by a simulation method under the condition that ~~an~~ a selected energetic beam is used when said elements of said pattern are transferred;

shifting one of the dose distribution images by said measured ΔX along said straight boundary line and by a desired amount ΔY in a direction ~~vertical~~ perpendicular to said straight boundary line relatively to the other and superimposing both of the dose distribution images; and

taking the correlation between image data obtained for said inspection and image data produced by the superimposing by comparing these two kinds of image data.

Claim 6 (original): The metrology method of claim 5, further comprising the steps of:

making a decision based on said correlation as to whether said ΔY should be updated;

resetting said ΔY if updated; and

updating said ΔY until said correlation decreases below a certain value.

Claim 7 (original): The metrology method of claim 5, further comprising the steps of:

updating said ΔY a set number of times; and

detecting the value of ΔY which minimizes said correlation (i.e., maximizes the degree of similarity).

Claim 8 (currently amended): The metrology method of any one of claims ~~5-7~~ 5 to 7, further comprising the step of storing image data about dose distributions corresponding to plural pattern shapes in memory.